

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES

Vol. XXX, No. 13, pp. 257-263, 2 figs.

October 29, 1965

OBSERVATIONS ON THE
TYPE SPECIMEN OF THE SCORPION
SYNTROPIS MACRURA KRAEPELIN

BY

HERBERT L. STAHNKE

Arizona State University
Tempe, Arizona

In his original description of *Syntropis macrura*, Kraepelin states that "as yet only a male is known." This statement, sixty-four years later, is still true since no other specimens have been taken of this unusual scorpion. This lack of additional material is apparently due to two conditions: the specimen represents a species of a small population and a very limited distribution; conditions not uncommon in the order scorpionida. These could have been subverted, however, if adequate collection data were available. Unfortunately, all we know is that L. Digueet was the collector and the locality "Lower California." Kraepelin described the species in 1900. A copy of the original German description of the genus and a translation of it follow.

Gattung *Syntropis* n. g.

Diese neue Gattung der *Vejoviden* schliesst sich in ihren Merkmalen eng an die Gattung *Vejovis* C. Koch an, unterscheidet sich aber von ihr in auffallender Weise dadurch, dass statt der zwei un-

teren Medialkiele im ersten bis vierten Caudal segment nur ein einziger, unpaarer Medialkiel vorhanden ist, wie bei den *Urodacinen* und *Hemiscorpioninen*. Die Endtarsen der Beine mit grossem Gehstachel, die Unterkante mit einer Reihe kurzer Dörnchen. Unterrand des beweglichen Mandibularfingers zahnlos. Palpenfinger auf der Schneide mit einer Längsreihe kaum unterbrochener Körnchen, daneben innen-seits sechs Seitenkörnchen. Mittellamellen der Kämme zu vielen, zum Teil perlschnurartig gerundet wie die Fulcren. Sternum fast so lang wie breit. Oberarm und Unterarm des Maxillarpalpus mit scharfen, gekörnten Randkielen, Unterarm in der Mitte der Vorderfläche ebenfalls mit gekörnter Langscrista.

Genus *Syntropis* n.g.

“This new genus of vejovid agreed closely in its characteristics to the genus *Vejovis* C. Koch, but it differs in a remarkable way from it in this way, that instead of the two inferior median keels on the first to the fourth caudal segments there is only a single, unpaired median keel, as in the case of the *Urodacinen* and *Hemiscorpioninen*. The terminal tarsal joint of the leg with a row of short small spines. The inferior edge of the movable mandibular finger toothless. The cutting edge of the palp fingers with a long almost unbroken row of small granules, six small side granules beside it on the innerside. The middle lamella of the pectines are numerous, part of which are bead-like as are the fulcra. Sternum almost as long as wide. Upperarm and forearm of pedipalps with sharp, granulated marginal keels. The middle of the forearm anterior surface likewise with granulated longitudinal keels.”

The original description of the species (Kraepelin, 1900, pp. 16-17) follows:

Syntropis macrura n. sp.

Bisher nur ♂ bekannt. Truncus und Cauda rostfarben, die Mit-ten der Abdominalsegmente etwas dunkler; Maxillarpalpen am Grunde gelbrot, dann rostrot, die Finger fast braunrot; Beine gelbrot.

Cephalothorax grob buckelkörnig, die Gegend um den Augenhügel feinkörnig, Stirn schwach gekörnt. Abdomen oberseits äusserst fein chagriniert, dazu auf den Seiten mit gröberen Höckerkörnchen. Bauch-seite des Abdomens glatt, letztes Segment jederseits mit einem et-was körnigen Längskiel. Cauda lang, schlank und dünn, über dop-pelt so lang wie der Truncus, das funfte Segment etwa siebenmal so lang wie dick. Caudalkiele alle deutlich entwickelt, der untere Med-ialkiel im fünften und vierten Segment reihenkörnig, im dritten und zweiten Segment glatt, scharf gratig, im ersten Segment glatt, wulstig gerundet; die unteren Lateralkiele im den vorderen Segmenten fein sägekörnig, in den hinteren deutlicher perlkörnig; obere Lateralkiele gleich den Dorsalkielen reihenkörnig, die Dorsalkiele ohne stärken Enddorn; ein unterbrochen körniger Nebenkiel im ersten Caudalseg-ment entwickelt, im zweiten nur durch zwei Körnchen am Ende ange-

deutet. Caudalflächen glatt, matt, auch im fünften Segment. Blase lang walzig, fein gekörnt, allmählich in den kurzen Stachel übergehend. Ober- und Unterarm des Maxillarpalpus mit gekörnten Randkielen, die Flächen glatt, nur der Oberarm unterseits in der Grundhälfte mit fast gereihten Körnchen in der Mittellinie, und der Unterarm auf der Vorderfläche mit Mediancrista. Hand gerundet, schlank, schmal, mit gekörnten Aussenrandkiel, sonst fast kiellos, fast glatt, nur am Innenrande etwas körnelig; ebenso die äussere Unterfläche mit schwacher Körnchenlängsreihe. Finger mit schwachem Lobus, mit sechs inneren Seitenkörnchen, fast doppelt so lang wie die Hinterhand. (Beweglicher Finger: Hinterhand: Dicke der Hand = 11,2: 6,5:3.) Schenkel der Beine feiner und gröber gekörnt, dorsal und aussenseits oben eine schwache, ventral eine stärkere Körnchencrista. Kämmе äusserst lang und schlank, fast mit halber Länge die Coxen des vierten Beines überragend; Mittellamellen etwa 20, Fulcra perlschnurförmig; Kammzähne 29.--Länge 94 mm. (Truncus: Cauda = 28:66); Fünftes Caudalsegment 17 mm., Blase mit Stachel 11,5 mm., Dicke der Blase 2,5 mm.

Unter-Kallifornien. --Bisher nue ein ♂ im Pariser Museum (L. Diguët ded.).

A translation of the above follows:

Syntropis macrura n. sp.

"As yet only the male is known. The trunk and cauda are rust colored, the middle of the abdominal segments is somewhat darker; the pedipalps are yellowish red at the base, then rust red, the fingers are almost brownish red; the legs are yellowish red.

"Cephalothorax densely, coarsely granulated, the region around the ocular tubercle is finely granulated, anterior portion weakly granular. Dorsum of abdomen very finely shagreened, in addition on the sides are thicker, tuberculated granuled. The ventral surface of the abdomen smooth with a somewhat granulated longitudinal keel on each side of the last segment. Cauda long, slender and thin, over twice as long as the trunk, the fifth segment is nearly seventimes as long as thick. The caudal keels are all well developed, the inferior median keel on segments IV and V bears a row of granules, on segments II and III smooth, acutely ridged, on the first segment smooth, with a rounded swelling; the inferior lateral keels on the anterior segments with fine, serrate granules but distinctly bead-shaped granules on posterior ones; the superior lateral keels like the dorsal keels bear a row of granules, the dorsal keels are without large terminal spine; an intermittently granulated lateral keel developed on the first caudal segment, in the second segment indicated only by two granules at the end. Caudal surface smooth, flat, even in the fifth segment. Ampulla long and cylindrical, finely granulated, changing gradually into the short aculeus. Upper and forearm of the pedipalps have granulated marginal keels, surface smooth, only interior surface of upperarm in the basal half with almost continuous rows of granules on median line, and

the forearm anterior surface with median keels. Hand rounded, slender, small with granulated exterior marginal keel, otherwise almost without keels, nearly smooth, only somewhat granular on inner margin; likewise the outer inferior surface with weak, longitudinal rows of little granules. Finger with weak lobe, with six inner, lateral granules, almost twice as long as the back hand. (Movable finger: back hand: thickness of the hand = 11.2:6.5:3.). Femur of the legs is thinner and more coarsely granulated, dorsal and exterior sides have above a weak, ventrally a stronger granulated keel. Pectines very long and slender, almost surpassing the coxa of the fourth leg on account of its length: about 20 middle lamellae, the fulcra are moniliformed; 29 pectinal teeth. -- Length is 94 mm. (trunk: cauda = 28:66); the fifth caudal segment is 17 mm., ampulla plus aculeus 11.5 mm., the thickness of ampulla 2.5 mm.

"Lower-California. -- As yet only one male in the Paris Museum (L. DIGUES ded.)."

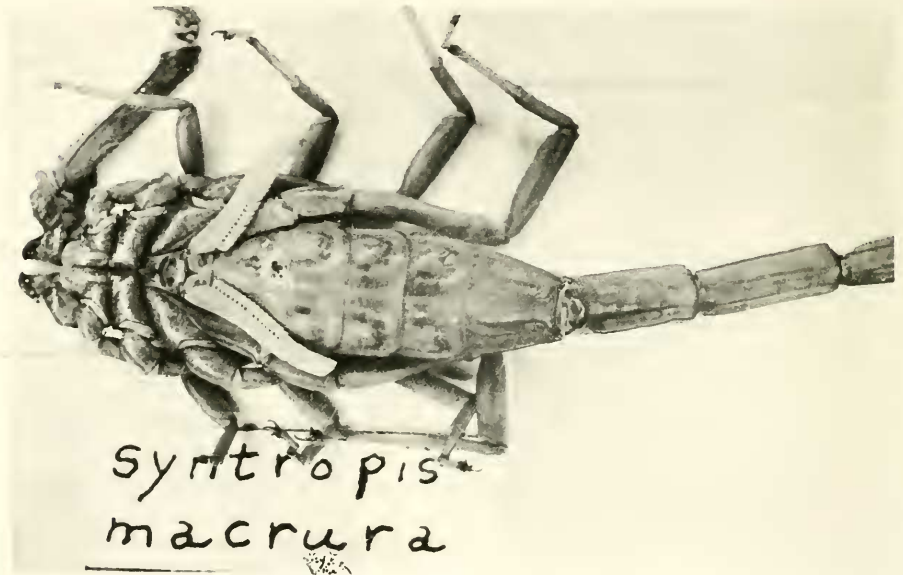


Figure 1. Note the long, slender pectines and the single, ventral median keel on segments I and II; all other known vejovids have two on segments I through IV.

DISCUSSION

In 1961, while in Paris, the writer examined the type specimen in the Laboratoire Zoologie, Museum Nationale D'Histoire Naturelle. At this time it was more of a dark straw color and not a "rust color" as Kraepelin states; a

change very likely produced by the preservative. The specimen is 97.95 mm. long which is the sum of the lengths of the non-telescoping, sclerotized parts of the trunk and cauda. The sternum is distinctly vejovid in form (fig. 1) as are also the presence of an interior and exterior pedal spur. However, the unusual length of the caudal segments and the extremely long and slender pedipalps are out of character for this family (fig. 2). The most unusual characteristic, as Kraepelin mentioned, is the presence of a single ventral median keel on caudal segments I (fig. 1) through IV. This cristate condition is found only in the Urodacinae (Scorpionidae), an exclusive Australian group and in the Hemiscorpioninae, found only in Arabia. In the latter group, the male telson is also very similar in shape to that of *S. macrura*. The inferior surface of the second tarsomeres has a median row of short, thick spines which become increasingly longer and are arranged in a Y-configuration distally similar to that found on *Paruroctonus* (Vejovid). Three lateral eyes are present. The granules of the cutting edge of the pedipalp fixed finger are in a continuous row and serrate. Both fixed and movable fingers are terminated with a large, claw-like granule and their tips are capped with an elongate, whitish spot. The stigmata are slit-like. The seventh sternite bears two distinct lateral keels which extend throughout approximately the median half of the segment. The crests of the anal arch are not strongly developed. The proximal one bears confluent granules while the distal one is agranular.

Measurements in millimeters:

Total Length.....	97.95	Appendages (Cont'd)	
Cauda.....	67.50	LENGTH	WIDTH
Trunk.....	30.35	Patella	8.7 1.9
Carapace.....	8.75	Femur	8.4 1.9
Pre-abdomen.....	21.60	Leg IV:	
Caudal segments:		Femur	9.8 1.6
NUMBER	LENGTH	Patella	7.8 1.9
I	7.6 3.6	Tarsomere I	
II	9.2 3.2	+ tibia	9.0
III	10.1 3.0	Sternum	1.8 1.5
IV	13.3 2.7	Telson	10.9
V	16.5 2.3	Aculeus	2.33
Appendages:		Ampulla	8.57 2.40
Pedipalp:		Thickness	2.50
Tibia	17.4	Genital plate	1.5 2.4
Hand	7.8 2.5	Basal piece	1.5 2.0
Movable		Pectinal teeth	29/29
finger	11.3		



Figure 2. Note unusually long, slender pedipalps, caudal segments and telson.

The above measurements indicate unusual proportions for a vejovid. The only other North American vejovids approaching these proportions are those of the genus *Paruroctonus*. The comparative ratios, with those of a male *Paruroctonus mesaensis* Stahnke given in parentheses, are as follows: Cauda/trunk, 2.23 (2.19); caudal segment I L/W, 2.11 (1.42)⁽¹⁾; caudal segment IV L/W, 4.93 (2.96); caudal segment V L/W, 7.17 (4.80); movable finger of pedipalp, L/hand width, 4.52 (1.84).

The unusual morphology of this species raises a number of questions to which the potential collector should be alert. The first of these is the possible variance in its behavior from that of the more commonly known vejovids which are often referred to as "ground" scorpions. This is in contrast to the slender buthids (genera *Centruroides* and *Tityus*) called "bark" scorpions. Ground scorpions hiding under objects show a positive geotropism and are efficient active burrowers. Bark scorpions most frequently seem to be negatively geotropic and cling to the underside of objects under which they are concealed. If *S. macrura* reacted in a similar manner the potential collector should be careful in turning over objects so as not to contact a specimen inadvertently. One would hardly expect the fragile looking *S. macrura* to be an efficient and active burrower, but would expect it to behave like a buthid.

The stouter and more robust vejovids, whether at rest or moving about, generally carry the cauda curled over their back. In contrast, the slender buthids generally curl the cauda to one side while at rest but have a tendency to drag the cauda while traveling. One would hardly expect *S. macrura* to behave like a vejovid.

(1) Vejovids generally have caudal segment I width as greater than the length.

Part of the defensive behavior of the vejovids, especially those of the genus *Hadrurus* and *Paruroctonus*, is to go through a threatening strutting reaction. At this time the preabdomen (mesasoma) and cauda (metasoma) are stiffened and held quite vertical to the substrate. The very slender buthids, on the other hand, have more of a tendency to give a flicking thrust and flee. The behavior of *S. macrura* and whether or not it will attempt to sting defensively is unknown.

No known vejovid has a venom sufficiently potent to be lethal to man through the natural sting except in relatively rare occurrences of hypersensitivity to scorpion venom. All scorpions known to have a lethal venom are buthids. The toxicity of the venom of *S. macrura* is unknown but those who seek this species should be wary.

This project was supported principally by National Science Foundation Grant No. G 13305.

REFERENCE

KRAEPELIN, K.

1900. Ueber einige neue Gliederspinnen. Abhandlungen aus dem Gebiete die Naturwissenschaften, vol. 16, pp. 1-17.